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ABSTRACT

This study examined correlations between teacher characteristics and teacher attitudes toward multimedia development among teachers creating multimedia projects in teacher teams and with students using HyperStudio. Information on personality type, age, gender, grade level, years of teaching, computer experience, and self-reported skill levels was collected from 123 teachers participating in a federally funded teacher training grant. This information was correlated with four constructs concerning teacher perceptions of the multimedia development process: teachers' perceptions of the individual stages of multimedia development, based on their development of multimedia projects within teams; teachers' perceptions of the individual stages of multimedia development, based on the integration of self-authored multimedia into their classrooms for student-created projects; teachers' attitudes toward the cooperative activities required by the grant; and teacher attitudes toward integrating self-authored multimedia into their curricula. Analysis found few significant correlations between the attitude constructs and teacher characteristics. Only self-reported skill levels were consistently and positively correlated with teacher attitudes toward multimedia development. The conclusion is drawn that confidence in one's ability to utilize the software and hardware necessary to create self-authored multimedia projects is the primary factor in predicting attitudes and perceptions of multimedia development. It is suggested that such confidence can be fostered by proper training. (Contains 15 references.) (MES)

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Correlations between Teacher Characteristics and Teacher Attitudes toward Multimedia Development among Teachers Utilizing the Multimedia Authoring Program, HyperStudio

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Abstract: This study examined possible correlations between certain teacher characteristics and teacher attitudes toward multimedia development among teacher creating multimedia projects in teacher-teams and with students, using HyperStudio. Information on personality type, age, gender, grade level, years of teaching, computer experience, and self-reported skill levels was collected from 123 teachers participating in a federally funded teacher training grant. This information was correlated with four separate constructs concerning teacher perceptions of the multimedia development process for both teacher-created and student-created projects. Analysis found few significant correlations between the attitude constructs and teacher characteristics. Only self-reported skill levels were consistently and positively correlated with teacher attitudes toward multimedia development. The conclusion is drawn that confidence in one's ability to utilize the software and hardware necessary to create self-authored multimedia projects is the primary factor in predicting attitudes and perceptions of multimedia development. It is suggested that such confidence can be fostered by proper training.

Introduction

This study (Sammons, 1999) proposed to examine the possible correlation between teacher characteristics – including personality type, demographics, self-reported computer skills, and computer experience in the classroom – with teacher attitudes and perceptions of self-authored multimedia. It has been suggested that integration of self-authored multimedia into the classroom will affect both student attitudes and student achievement, as students engage a subject by writing, recording, and illustrating in multimedia computer formats (Turner and Dipinto, 1992; Ayersman, 1996; Lachs and William, 1998). At least one study also suggests that the introduction of self-authored multimedia will influence teaching methods, with teachers working collaboratively as facilitators and mediators, with the students (Berg et al., 1998).

Subjects for this study were a group of more than 240 teachers who were participating in a federally funded Technology Innovation Challenge Grant obtained by the Blackfoot, Idaho, School District. The Challenge Grant has, as one of its goals, the training of teachers in the creation and integration of self-authored multimedia. The initial group of teachers represented teams from nearly 40 school districts within Idaho. Each team attended an intensive four-day training session in multimedia development in the summer of 1998. This training included sessions on flowcharting, storyboarding, authoring using HyperStudio software, as well as on using digital cameras, scanners, and image manipulation software.

Four attitude constructs were identified for this study; each of the four constructs were measured by means of an attitude survey distributed to the teams in the spring of 1999. These four constructs were (1) teachers' perceptions of the individual stages of multimedia development, based upon their development of multimedia projects within their teams; (2) teachers' perceptions of the individual stages of multimedia development, based on their integration of self-authored multimedia into their classrooms for student-created projects; (3) teachers' attitudes toward the cooperative activities required by the grant; and (4) teachers' attitudes toward integrating self-authored multimedia into their curricula. Additional information was gathered on teachers' gender, age, the number of years they have taught, the grade level they teach or area of responsibility within the school district, their previous computer and multimedia technology experience, and their self-reported skill level with the hardware and software provided by the grant. The

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Myers-Briggs Personality Type Indicator (MBTI) was used to determine a personality type for each respondent. Each of the four attitude constructs were correlated with each of the demographic and computer experience variables.

Previous studies (Clark and Wheeler, 1994; Katch & Francis, 1995; Katz, 1992: Smith et al., 1995) have examined possible relationships between personality types and computer aptitude. Although none of these studies indicated that a certain personality type could be predicted to adopt computer technology more readily than others, Smith (et al., 1995) noted a tendency for Introverted/Sensing types to have more positive attitudes toward computer technology than other types. Clark and Wheeler (1994) noted a tendency, which was not statistically significant, for Judging types to achieve higher grades than Perceiving types on computer programming. They also noted that Sensing types had higher programming scores than did Intuiting types. The results of these studies encouraged us to examine whether personality types, as indicated by the MBTI, might be a factor in teacher attitudes toward self-authored multimedia programs, such as HyperStudio, and the development of multimedia projects.

Limitations of the Study

Because the study population was not selected at random, the results of this study cannot be taken as representative of the general teaching population nor even of teachers in Idaho. The study is also limited in that it does not account for every possible variable which might affect teacher attitudes toward multimedia development. Other factors which are not measured here might include support (or lack of support) for multimedia development from administrators and colleagues, personal and professional time available to development multimedia skills, individual cognitive styles, individual teaching styles, and the teachers' interactions with students.

However, by using grant participants as the study population, some external factors have been controlled. For example, the uniform nature and timing of the training provided by the grant lessens possible differences in basic skill levels or available technology among the participants. Each grant trainee was given the same suite of hardware and software, and each participated in one of six identical, week-long training sessions. Some participants may have greater skills levels, of course, but questionnaires during the first day of each session indicated that a majority of grant participants were completely novice to multimedia development and to HyperStudio in particular.

Another limitation of this study stems from the delivery and administration of the instruments. Because both the MBTI and the grant-created questionnaire were self-administered in the field, grant staff had little control over the timing, sequence, or environment of administration. A final limitation concerns the response rate. Although 244 MBTIs and surveys were sent to grant participants, only 117 MBTIs and 123 inventories were returned, a response rate of slightly less than 50%. The respondents are in some sense self-selecting and may not accurately represent the attitudes, perceptions, and experiences of the group as a whole. Thus, the conclusions of this research are confined to the respondents themselves. These conclusions are consistent with findings in previous research, however, (as summarized in Dupagne and Krendl, 1992, for example) and suggest possibilities for future research.

Method

Two instruments were distributed to the 244 teachers who participated in the grant's 1998 training sessions. The MBTI (Form G) and a grant-created inventory were sent to team leaders in the spring of 1999 with the request that the team leader oversee their completion and return. An equal number (123) of MBTIs and inventories were returned, but six of the MBTI forms were unsigned and could not be correlated with the inventory.

The grant-created inventory had six parts. The first part gathered demographic information from the participants: age, gender, years of teaching , primary responsibility in the school district, and grade level/subjects taught. Part II asked respondents to rate their skill level on each of the six computer skills relevant to multimedia development. Rating their skill level from *Low* to *Advanced*, participants were asked

to assess their capabilities with (1) their operating system, (2) Inspiration flowcharting software, (3) image manipulation software such as PhotoShop or PhotoStudio, (4) HyperStudio multimedia authoring software, (5) the digital camera, and (6) the scanner. All the software, the camera, and the scanner, as well as training in their use, were provided to the participants by the grant.

In Part III of the inventory, participants reported their experience with computer technology in their classroom (how many computers in the classroom, how many years had computers been used in their classrooms, how much time did students spend on computers at school) and their experience with multimedia authoring software. More than two-thirds of the respondents indicated that the grant training was their first experience with HyperStudio. In Part IV of the inventory, respondents were asked to assess the four stages of multimedia development as modeled for them during the summer training. First they were asked to rate brainstorming, flowcharting, storyboarding, and authoring (HyperStudio) as either simple/complex, easy/difficult/ and understandable/confusing based upon their development of multimedia projects within the teacher teams. Then they were asked to rate these four steps in terms of usefulness, effectiveness, and efficiency, based upon their integration of multimedia development into their classrooms for students projects. Part V of the inventory asked respondents to assess the cooperative nature of the teams' activities as determined by their perception of the team's collaboration on four team projects assigned by the grant. The final part of the inventory (Part VI) gathered information on the teachers' attitudes toward the importance of integrating self-authored multimedia programs into their classroom curricula.

Following receipt of the MBTIs and inventories, all forms were hand-scored and entered into spreadsheets by grant staff. MBTI categories were determined following scoring procedures provided by Consulting Psychologist Press, the publishers by the MBTI. Scores for the inventory were combined by constructs. In some cases, scores were grouped or averaged so that meaningful categories of responses could be obtained which would be suitable for chi-square analysis. For example, teacher ages ranged from 26 to 58. These data were grouped as 20-29, 30-39, 40-49, and 50-59 so that only four age groupings would be used for correlational analysis. Similarly, scores for the perceptions of the four stages of multimedia (a possible range of 1-4 on each construct for each stage for an overall possible range of 12-48) were also averaged and categorized as values 1 through 4. This grouping of data assured that there would be sufficient cases in each possible cell to warrant chi-square analysis.

Results

Descriptive Statistics

Results of the MBTI show that all sixteen personality types are represented among the grant respondents. The personality type that is most frequent, the ISFJ type, is over-represented in the grant population when that population is compared to normed general population samples as reported by Myers and McCaulley 91985). The ISFJ type is characterized as organized, dependable, and responsible. "ISFJs often choose careers where they can combine their careful observation and their caring for people," such as health professions or teaching (Myers and McCaulley, 1985, p. 27). Their tendency to be accurate and organized often places these individuals in supervisory roles. Previous studies (Smith et al., 1995; Clark and Wheeler, 1994) indicate that Introverted/Sensing and Judging types all display positive attitudes and aptitude for computer applications.

Demographic information from the respondents indicates that the typical respondent is between 40 and 49 years of age and is female. Most teachers in the group had ten or more years of teaching experience. While many of the respondents are elementary teachers (37.2%), most teachers among the respondents have middle or secondary schools responsibilities (48.9%, grades 6-12).

Descriptive statistics for each question, construct, and part of the grant inventory suggests that the teachers in this sample have a predominantly positive attitude toward the stages of multimedia development and toward integrating self-authored multimedia projects into their curricula. The respondents also had a strongly positive attitude toward the cooperative activities required by the grant and report that they too

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would utilize a cooperative learning model in teaching or utilizing multimedia development in their classroom.

Inferential Statistics

Of all the correlations between the four attitude and perceptions constructs and the demographic and computer experience variables, most proved to be insignificant. There were, however, some very suggestive correlations which were found to be significant.

Teachers' perceptions of multimedia development, based on their team projects, did not demonstrate any significant relationship with personality type, gender, age, number of years teaching or grade level taught. The Sensing/Intuition preference scale, which is one of four scales along which the MBTI types are defined, shows a slight but definite positive correlation with this construct. Teachers' perception of multimedia development, based on their team projects, also correlated positively with self-reported levels of computer skills and with general computer technology experience.

Teachers' perceptions of multimedia development, based on their integration of self-authoring multimedia applications into their curricula, correlated with grade level taught. This correlation is moderate but definite, indicating that teachers in older grades (middle and secondary schools) generally found all four aspects of multimedia development to be more useful, effective, and efficient than did their elementary counterparts. This construct also correlated positively with self-reported computer skill ratings.

No relationship was found between any of the independent variables and the questions concerning attitudes toward the cooperative activities required by the grant.

Attitude toward integrating self-authored multimedia into classroom curricula did correlate slightly with number of years teacher and with general computer technology experience. Respondents who had taught ten years or less tended to demonstrate mixed responses to questions concerning multimedia integration. Respondents with 11 or more years of teaching tended to be more positive in their attitude. Respondents who had more experience integrating technology into their classrooms or who had more computers in their classrooms also tended to have more positive attitudes toward integration of self-authored multimedia. This construct also correlated positively with self-reported computer skill levels.

Conclusions

This study has provided evidence of positive correlations between teachers' attitudes toward the stages of multimedia development and toward multimedia integration, and teacher characteristics such as years of teaching, grade level taught, general computer technology experience, and self-reported computer skill levels. Of these variables, only the last correlates strongly with all three measures of teacher attitudes toward multimedia development.

Dupagne and Krendl (1992), in a summary of literature, found that most studies reported a positive correlation between attitude and experience. They also found that factors which negatively influence attitude include inadequate training. Cate and McNaull (1993) also found that level of training significantly affects attitude toward computer technology. Marcinkiewicz (1994, 1996) went beyond a simple correlation between training and attitude to infer that training fostered feelings of self-efficacy, and it was the sense of self-efficacy that improved attitude and performance. The results published here (also see Sammons 1999) support these previous studies. The strongest correlations occur between self-reported computer skills and attitudes toward multimedia development and integration. A majority of teachers rated their skill level as *High* or *Advanced* in all designated computer skills, except flowcharting software (Sammons 1999, Table 11). A majority of teachers also reported that they had less than a year's experience with HyperStudio and that they had learned multimedia development primarily through the grant training. How then did these teachers come to feel so comfortable with the different hardware and software necessary to author multimedia projects on their own and with students? It seems obvious that the answer to this question is: the training provided by the grant. Therefore, a logical inference is that positive attitudes toward

multimedia development and integration can be fostered by increasing practitioners' confidence in their ability to use the necessary programs and equipment. This confidence is increased by appropriate training.

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